

Lectotypification of *Elatostema subscabrum* H.Schroet. (Urticaceae)

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Abstract

Descriptions of *Elatostema sessile* J.R.Forst. & G.Forst and *E. subscabrum* H.Schroet. (Urticaceae) are provided to clarify the morphological differences between these two species. The lectotype of *E. subscabrum* H.Schroet. (Urticaceae) is here selected.

Introduction

Elatostema J.R.Forst. & G.Forst. (Urticaceae) is a very speciose genus of at least 300 species occurring throughout the Old World tropics, subtropics and subtemperate regions. The general lack of knowledge about the systematics and circumscriptions of the species has resulted in the frequent incorrect application of plant names because there are no recent publications on the systematics of this group. The most recent account of the genus by Schröter and Winkler (1936) was based on the relatively few collections that were available. Furthermore, this publication only described species of subgenera *Elatostematoides*, *Pellionia*, and *Weddellia* (as circumscribed by them). Species of *Elatostema sensu stricto*, that Schröter and Winkler (1935) regarded as consisting of 240 species, were not included in their publication.

Recently, progress has been made on our understanding of the taxonomy and phylogeny of the Urticaceae (Friis, 1993; Hadiah *et al.*, 2003, 2008; Sytsma *et al.*, 2002; Wilmot-Dear, 2009) and tribes, in particular Elatostemateae (*sensu* Conn and Hadiah, 2009). Traditionally, the taxonomic studies of the genus were based on morphological characteristics (Robinson, 1910, 1911; Schröter and Winkler, 1935, 1936; and Weddell, 1854, 1856, 1857, 1869). A detailed discussion of the morphological characteristics used to circumscribe taxa within *Elatostema* and their usefulness in re-

construction of phylogenies are presented in Hadiah and Conn (2009). There has been a large volume of work on the taxonomy of the Chinese species of *Elatostema sensu lato* (Wang, 1980a, 1980b; Yang *et al.*, 1995), one of the centres of species diversity for the genus. However, little has been published on the Malesian species, which are part of another major centre of diversity. With relevance to this paper, the above studies provide an, albeit incomplete, framework for further systematic study of the genus.

During studies of the Malaysian species of Urticaceae, material of *E. sessile* has often been confused with *E. subscabrum*. Two herbarium sheets of type material of *E. subscabrum* were located at the herbarium of the Singapore Botanic Gardens (SING). These specimens clarify the circumscription of the latter species.

***Elatostema subscabrum* H.Schroet.**

Repertorium specierum novarum regni vegetabilis 83: 1 (1935) 20 in obs.;
Repertorium specierum novarum regni vegetabilis 83: 2 (1936) 85.

Lectotype (here chosen): Malaysia, Pahang, Telom, Nov 1908, *H.N. Ridley* 13789 (upper left specimen, SING *s.n.*); isolectotype (lower right specimen, SING *s.n.*). Other syntype material: *H.N. Ridley* 13789 (SING67093) (refer to discussion of lectotypification, below).

Terrestrial **herb**, 0.15-0.2 m high, self-supporting (erect/suberect) or spreading; internodes developed (elongate, distinct); branched hairs lacking; stinging hairs absent; monoecious. Stipules axillary, interpetiolar, persistent, free, 1-1.3 mm long. **Leaves** opposite, appearing alternate (by misinterpretation – nanophylls caducous); petiole absent (or < 2 mm long); megaphylls with lamina 23-60 mm long, 12-24 mm wide (length to width ratio 1.92-2.5), unequal-sided, larger side of lamina ovate to elliptic, smaller side elliptic to obovate; surface flat, not rugose, with 4 or 5 vein-pairs; venation actinodromous ('type IVd, semi pinnate nerved' *sensu* Schröter and Winkler, 1935); basal pair of secondary veins arising from above base of primary vein and arising from different points (more than 2 mm apart), both directed towards margin (or almost so), joined to next distal secondary vein; abaxial surface with cystoliths present on interstices (cystoliths linear), with hairs on primary, secondary and tertiary veins; adaxial surface lacking cystoliths, glabrous; base oblique, rounded or cuneate; margin toothed, not lobed, glabrous; apex short-acuminate; nanophylls not known. **Inflorescences** unisexual; male inflorescences not known; female inflorescence sessile to shortly pedunculate, unbranched, head-like, involucre bracts narrowly ovate, sparsely hairy to almost glabrous; bracteoles very long, narrowly ovate; **flowers** condensed/crowded, unisexual; actinomorphic (or slightly

asymmetrical); tepals 4, free, unequal, one tepal c. 1 mm long with appendage 1-1.5 mm long; 3 tepals slightly smaller, ca 0.75 mm long without appendage; staminodes present, 4, inflexed in bud; ovary straight; style absent; stigma oblong, filiform to linear. **Achene** not enclosed (or only partly so); surface ribbed or punctate.

Lectotypification of *Elatostema subscabrum* H.Schroet.

Hilde Schröter described the new species *E. subscabrum* from material collected from Telom, Pahang, Malaysia, with the type cited as *Ridley 13789* (SING) (Schröter and Winkler, 1936). Two sheets of syntype material are held at SING. One herbarium sheet is annotated: ‘*H.N. Ridley 13789*, Nov, 1908, Telom [all written in Ridley’s hand], State of Pahang, Malay Peninsula [State and region part of pre-printed label – lower right of sheet]’ (SING67093), with field identification ‘*Elatostema ?acuminatum*’ [in Ridley’s hand] has three separate samples of the plant: all specimens are female and largely in fruit (Fig. 1). The second sheet, ‘*H.N. Ridley 13789*, Nov, 1908, Telom, State of Pahang, Malay Peninsula’ [as annotated above – upper left of sheet] (SING), except identified as ‘*E. acuminatum*, Brongn.’ by ‘CXF’ [Caetano Xavier Furtado, Singapore Botanic Gardens, 1923-1952, then 1956-1960] and the label has been stamped ‘30 MAR, 1909,’ presumably the date when the material was accessioned into the herbarium (Fig. 2). This second sheet has two female specimens, upper left with flowers and fruits, and the lower right specimen largely in fruit. Both sheets have been examined by Schröter and annotated as ‘*Elatostema subscabrum* Hilde Schröter [in her hand], dated ‘1935’ [in her hand], and ‘det. Hilde Schröter [pre-printed determinavit slip]. Furthermore, Schröter notes that she has not examined male inflorescences (refer protologue), only female inflorescence, female flowers and fruit. The upper left specimen of the latter sheet (SING) is a good match for the protologue. Therefore, it is here selected as the lectotype because it has both flowers and fruits (in accordance with Articles 7.11, 8.1-8.3; McNeil *et al.*, 2006).

Lectotype (chosen by Florence, 1997): *J.G.A. Forster* [186], Société, Tahiti (P-Forst); isolectotype: *Forster s.n.* (BM, K); probably isolectotype: ‘*Dorstenia pubescens*’ (MW). For further discussion refer Nicolson and Fosberg (2003, pp. 677 & 678).

Distribution: Malaysia; Malay Peninsula, Pahang – only known from type.

Notes: Collections of *E. sessile* from Malaysia have frequently been misidentified as *E. subscabrum*; however, the two species can be distinguished by the morphological characters listed in Table 1 (below).



Figure 1. Isolectotypes of *Elatostema subscabrum* H.Schroet. (Urticaceae) (SING67093).



Figure 2. Lectotype (upper left) and isolectotype (lower) of *Elatostema subscabrum* H.Schroet. (Urticaceae) (SING s.n.).

Table 1. Diagnostic morphological features distinguishing *Elatostema subscabrum* from *E. sessile*.

| Character | <i>E. subscabrum</i> | <i>E. sessile</i> |
|--------------------------|--|---|
| Female inflorescences | Appearing ‘hairy’ because of very long, narrowly ovate, tapering, unequal bracteoles | Not appearing ‘hairy’ because of shorter bracteoles not extending the involuclal bracts |
| Tepals of female flower | 4; unequal size, one of which is longer with a long appendage | 3; unequal, without appendage |
| Female flower tepal size | Distinct and readily visible | Minute, difficult to observe |

***Elatostema sessile* J.R.Forst. & G.Forst.**

Characteres Generum Plantarum 53, n. 2 (1775); ed. 2 (1776) 106.

Terrestrial **herb**, 0.3-0.5 m high, self-supporting (erect/suberect); internodes developed (elongate, distinct); branched hairs lacking; stinging hairs absent; monoecious. Stipules caducous. **Leaves** opposite, appearing alternate (by misinterpretation – nanophylls caducous); sessile (or petiole < 2 mm long); megaphylls (45-)50-135(-155) mm long, (21-)22-55(-64) mm wide (length to width ratio (2.1-)2.2-2.5), unequal-sided, larger side of lamina ovate to elliptic, smaller side as for larger side or to slightly obovate; surface smooth, not rugose, with 4 or 5 vein-pairs; venation asymmetric, actinodromous; basal pair of secondary veins arising above base of primary vein and arising from one point (or less than 2 mm apart), both directed towards apex (or almost so), joined to next distal secondary vein; abaxial surface with linear cystoliths on interstices and hairs on primary, secondary and tertiary veins; adaxial surface with linear cystoliths interstices and on primary, secondary and tertiary veins, hairs occasionally present on interstices; base oblique, rounded or cuneate; margin toothed, not lobed, sparsely hairy; apex acuminate; nanophylls absent. **Inflorescences** unisexual; **male inflorescences** (based on Weddell, 1869; not known by current authors) sessile or shortly pedunculate, depressed-globose, involuclal bracts present, broadly ovate, hairy on margin; **female inflorescence** sessile or sometimes shortly pedunculate, unbranched, discoid; involuclal bracts present, with margin hairy, with long appendage; bracteoles linear-spathulate, ciliate; flowers

condensed/crowded. unisexual: actinomorphic (or slightly asymmetrical): tepals 3, very minute (appearing absent), unequal, free, appendage absent: staminodes 3, inflexed in bud: ovary straight: style absent: stigma oblong, filiform to linear. **Achene** $0.4-0.63 \times 0.25-0.35$ mm not enclosed (or only partly so): surface smooth or ribbed.

Selected specimens examined: MALAYSIA. Perak: Rotan Segar limestone Hill near Tambun, 29 Nov 1960, *Allen 4652* (SING); Maxwell's Hill, 7 Dec 1965, *Shah & Sidek 1146* (SING); Ah Kee Iron Mine, Ipoh, 21 Oct 1958, *Sinclair 9890* (SING). INDONESIA. **Sumatera Utara:** Kabupaten Karo, Air terjun Sikulikap, Desa Mejuah-juah, 21 Jun 2001 *Hadihah, Conn & Ariyanti 453* (NSW); **Jawa Barat:** Gunung Gede-Pangrango National Park, track to air terjun Cibeureum, 25 Aug 1998, *Hadihah 148* (NSW); Bogor, Wana Wisata Curug Nangka, Curug Sawer, Warung Loa, 29 Sep 1998, *Hadihah 253* (NSW).

Distribution: Malaysia. Malay Peninsula: Perak, Perlis, Pahang and Kelantan. Indonesia. Sumatera: Sumatera Utara, Sumatera Barat and Jambi; Jawa: Jawa Barat, Jawa Tengah and Jawa Timur; Bali.

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References

- Conn, B.J. and J.T. Hadihah. 2009. Nomenclature of tribes within the Urticaceae. *Kew Bulletin* **64**: 349-352.
- Florence, J. 1997. *Flore de la Polynesie française*. Volume 1. ORSTROM, Paris.
- Forster, J.R. and G. Forster. 1775. 53. *Elatostema*. *Characteres generum plantarum* ... B. White, T. Cadell & P. Elmsly, London.
- Friis, I. 1993. Urticaceae, pp. 612-63. In: Kubitzki, K., J.G. Rohwer, and V. Bittrich (eds.). *The families and genera of vascular plants II, flowering plants – dicotyledones. Magnoliid, hamamelid and caryophyllid families*. Springer-Verlag, Berlin.

- Hadijah, J.T. and B.J. Conn. 2009. Usefulness of morphological characters for infrageneric classification of *Elatostema* (Urticaceae). *Blumea* **54**: 181-191.
- Hadijah, J.T., B.J. Conn and C.J. Quinn. 2008. Infra-familial phylogeny of Urticaceae, using chloroplast sequence data. *Australian Systematic Botany* **21**: 375-385.
- Hadijah, J.T., C.J. Quinn and B.J. Conn. 2003. Phylogeny of *Elatostema* (Urticaceae) using chloroplast DNA data. *Telopea* **10**: 235-246.
- McNeill, J., F.R. Barrie, H.M. Burdet, V. Demoulin, D.L. Hawksworth, K. Marhold, D.H. Nicolson, J. Prado, P.C. Silva, J.E. Skog, J.H. Wiersema and N.J. Turland. 2006. International Code of Botanical Nomenclature (VIENNA CODE). 2006. *Regnum Vegetabile* 146. ARG Gantner Verlag, Ruggell, Liechtenstein. (<http://ibot.sav.sk/icbn/main.htm>; viewed 25 Oct 2009).
- Nicolson, D.H. and F.R. Fosberg. 2003. *The Forsters and the botany of the second Cook expedition*. A.R.G. Gantner-Verlag, Ruggell, Leichenstein.
- Robinson, C.B. 1910. Philippine Urticaceae. *The Philippine Journal of Science* **5**: 465-542.
- Robinson, C.B. 1911. Philippine Urticaceae II. *The Philippine Journal of Science* **6(4)**: 299-314.
- Schröter, H. and H. Winkler. 1935. Monographie der gattung *Elatostema* s.l.: Allgemeiner teil. *Repertorium specierum novarum regni vegetabilis* **83(1)**: 1-71, figs 1-44.
- Schröter, H. and H. Winkler. 1936. Monographie der gattung *Elatostema* s.l.: Spezieller teil. *Repertorium specierum novarum regni vegetabilis* **83(2)**: 1-237, figs 9-40.
- Sytsma, K. J., J. Morawetz, J. C. Pires, M. Nepokroeff, E. Conti, M. Zjhra, J. C. Hall and M. W. Chase. 2002. Urticalean rosids: circumscription, rosid ancestry, and phylogenetics based on *rbcL*, *trnL-F*, and *ndhF* sequences. *American Journal of Botany* **89(9)**: 1531-1546.

- Wang, W.-T. 1980a. Classificatio specierum *Elatostematis* (Urticaceae). *Bulletin of Botanical Laboratory of North-Eastern Forestry Institute* **4**: 1-96.
- Wang, W.-T. 1980b. Classificatio specierum *Pellionae* (Urticaceae). *Bulletin of Botanical Laboratory of North-Eastern Forestry Institute* **6**: 45-66.
- Weddell, H.A. 1854. Revue de la famille de Urticacees. *Annales des Sciences Naturelles; Botanique, Series* **4(1)**: 173-212.
- Weddell, H.A. 1856. Monographie de la famille des Urticées. *Nouvelle Archives du Muséum d'Histoire Naturelle* **9**: 1-400.
- Weddell, H.A. 1857. Monographie de la famille des Urticées. *Nouvelle Archives du Muséum d'Histoire Naturelle* **9**: 401-592.
- Weddell, H.A. 1869. Urticaceae, pp. 32-35. In: De Candolle A. (ed.) *Prodonius Systematis naturalis regni vegetabilis*. Volume 16, part 1. Masson, Paris.
- Wilmot-Dear, C.M. 2009. Urticaceae for the non-specialist: Identification in the Flora Malesiana region, Indochina and Thailand. *Blumea* **54**: 233-241.
- Yang, Y.-P., B.-L. Shih and H.-Y. Liu. 1995. A revision of *Elatostema* (Urticaceae) of Taiwan. *Botanical Bulletin of Academia Sinica* **36**: 259-279.

